

Organelle biogenesis and communication in plant cells

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What a wonderful time this is for plant cell biology! Never before has a wealth of tools been adopted and adapted to dissect the molecular mechanisms underlying the functions of the plant cell. Genome sequencing, subcellular proteomics, and advanced imaging are just some of the astounding array of technologies that hold the promise to revolutionize the way we can study and appreciate plant cells. In a nutshell, this is what this Special Issue of *Plant Cell Reports* on ‘Organelle Biogenesis and Communication in Plant Cell’—the first of its kind for this journal—aims to bring to light in a unique collection of reviews and research articles. With no doubt, recent advances in organelle purification and proteomics coupled with entire genome sequencing are yielding important discoveries on species evolution as highlighted by Jo et al. (2011) and Lang et al. (2011), and advanced microscopy is allowing for the visualization and tracking of previously unknown aspects of organelle dynamics at a subcellular level in intact tissues, such as the regulation of mitochondrial morphology and motility in embryos presented by Yamaoka et al. (2011). Indeed, it is now possible to understand how organelles are implicated in more general aspects of plant biology, including cytoplasmic male sterility, as discussed by Matsunaga et al. (2011), nitrogen assimilation, as

reviewed by Hakiya et al. (2011), and the regulation of developmental pathways, which, as reviewed by Merkle (2011), can be controlled through the nucleo-cytoplasmic transport of their signaling components. Finally, there have also been unprecedented advances in our understanding of the role of lipids and proteins in organelle membrane assembly, aspects of which are reviewed by Melser et al. (2011) and Abell and Mullen (2011).

Taken together, the reviews and articles in this Special Issue of *Plant Cell Reports* summarize some of the state-of-the-art research in the field of plant cell biology and how our view of the cell is being constantly challenged as new information is acquired. However, this is only a facet of plant cell biology and the reader is encouraged to examine future issues of *Plant Cell Reports* for further examples of research that highlight this exciting field. We are indebted to all of the contributing authors for their thought-provoking reviews and research articles and to those colleagues that acted as reviewers.

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